Ethylene Oxide: Technical Review
BCP Ingredients – St. Gabriel, LA

As EPA pursues its mission to protect public health and the environment, addressing ethylene oxide (EtO) remains a major priority for the Agency. EPA's National Air Toxics Assessment (NATA), released in August 2018, identified a number of areas across the nation with potentially elevated risk from continuous exposure to EtO in the outdoor air. NATA estimated these risks based on EtO emissions from 2014, which were the most recently available at the time, and are now seven years old.

NATA is a screening-level analysis that is intended to identify pollutants or areas for closer examination. EPA and the State air agencies are working together to better understand emissions in areas that NATA identified as potentially having elevated risk. State air agency partners are in discussions with individual facilities to identify opportunities for reducing EtO emissions from those facilities. EPA is reviewing its national regulations for industrial facilities that emit EtO. Actual risks today may be lower or higher than NATA estimated due to several factors, including updated or more refined facility emissions information or recent facility changes including the installation of pollution controls.

The information below describes the technical analyses conducted for BCP Ingredients in St. Gabriel, LA., to update and document work conducted since NATA was issued in August 2018. EPA is providing this information, to address, in part, the EPA Office of Inspector General's Management Alert (dared March 31, 2020).

Initial Actions Conducted

On October 15, 2020, EPA Region 6 requested assistance from the State of Louisiana in gathering the most current information on ethylene oxide emitting facilities, including BCP Ingredients, and to assist with the update of technical assessments.

- EPA obtained updated facility emissions and control information on EtO from the State of Louisiana.
- The EPA NATA estimate was based on annual emissions data from 2014. EPA obtained the 2019 annual routine EtO reported emissions at BCP Ingredients which showed a decrease of 96 percent. Reported emissions were reduced through emission reductions and/or re-evaluation of actual emission levels.
- EPA and LDEQ held a conference call with BCP Ingredients on March 25, 2021 and discussed facility efforts to reduce reported ethylene oxide emissions and obtained additional technical information. BCP Ingredients sent their March 25, 2021 slide presentation to EPA.

Preliminary 2020 Annual Emissions Data Update

The 2020 emissions inventory data updates from facilities were due for submissions to LDEQ on April 1, 2021. While an LDEQ quality assurance/quality control review of this new 2020 emissions data continues, the preliminary review of this data, along with information received from BCP Ingredients indicate that:

- From 2014-2020, through emission reductions and/or re-evaluation of actual emission levels, reported EtO annual emissions at the BCP Ingredients facility were reduced about 99 percent.

Summary of Facility Efforts to Improve EtO data quality and reduce EtO emissions

- Prior to 2018, estimated values were used to calculate emissions. The methods previously used overestimated EtO emissions as it was a conservative calculation and not from actual monitoring data.
- A Leak Detection and Repair (LDAR) Program was voluntarily implemented in 2018 at all domestic facilities. BCP Ingredients uses an outside agency to test the components in the plant. BCP Ingredients collects, analyzes, and reports actual measurements and data versus previous estimates for EtO.
- BCP Ingredients started the LDAR program with measurements one time per year, expanded to two times per year in 2019, and currently are testing four times per year. 218 EtO components (valves/flanges/pumps) are checked quarterly to improve data and further reduce EtO emissions.
- An upgraded ethylene oxide gas scrubber was installed on January 28, 2020 to further reduce EtO emissions. This allows for venting/depressurizing of the ethylene oxide railcar unloading arms to the scrubber after the unloading lines are purged with nitrogen.

Updated EPA Risk Assessment

Based on 2018 emissions inventory data, EPA is updating the estimated inhalation public health risk from ethylene oxide in the community near BCP Ingredients. 2018 data was chosen for its general availability and data quality. The revised increased cancer risk number is 10 in 1 million[1].

EPA modeling of estimated risks is very conservative. It provides a threshold recommendation to warrant a closer look at facility operations and emissions and is not a "bright-line" regulatory action limit for required action. EPA uses a general 100 in 1 million (1 in 10,00) increased risk of cancer as a guideline for further investigation. It assumes a continuous, 24 hours per day inhalation exposure to hazardous pollutants, including EtO, for a lifetime of 70 years.

Based on 2018 data, EPA reassessed and updated the estimated inhalation public health risk from hazardous air pollutants, including EtO, in the community near BCP. Our results indicate the estimated maximum individual cancer risk (the single highest estimated additional cancer risk for an individual in the area) decreased about 99 percent from the previous NATA risk estimate based on 2014 emissions (from 2,539 in 1 million to 10 in 1 million).

Preliminary 2020 annual EtO emissions are slightly less than the 2018 EtO emissions assessed by EPA.

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[1] In a letter dated June 17, 2021, pursuant to CAA section 307(d)(7)(B), the Agency will grant reconsideration on the following aspects of the final Miscellaneous Organic NESHAP (MON) rule to provide an additional opportunity for public comment: (1) the use of EPA's Integrated Risk Information System (IRIS) value for ethylene oxide in assessing cancer risk for the source category; and (2) the use of the TCEQ risk value for ethylene oxide as an alternative risk value to EPA's IRIS value. Reconsideration is being granted on this topic on the basis that the TCEQ risk value for ethylene oxide was finalized after the comment period closed and because the risk posed by ethylene oxide is of central relevance to EPA's determination that risks from sources in the Miscellaneous Organic Chemical Manufacturing source category are unacceptable and that more stringent standards are required.

Future Actions Planned

The 2018 estimated cancer risk due to emissions from BCP Ingredients is well below the EPA guideline of a 100 in 1 million (or 1 in 10,000); no further investigation or action is recommended at this time.

Additional information and will be provided at a community outreach event currently being planned by EPA in coordination with LDEQ, and at the following website after the outreach event is conducted: https://www.epa.gov/hazardous-air-pollutants-ethylene-oxide/status-report-bcp-ingredients-st-gabriel-la.